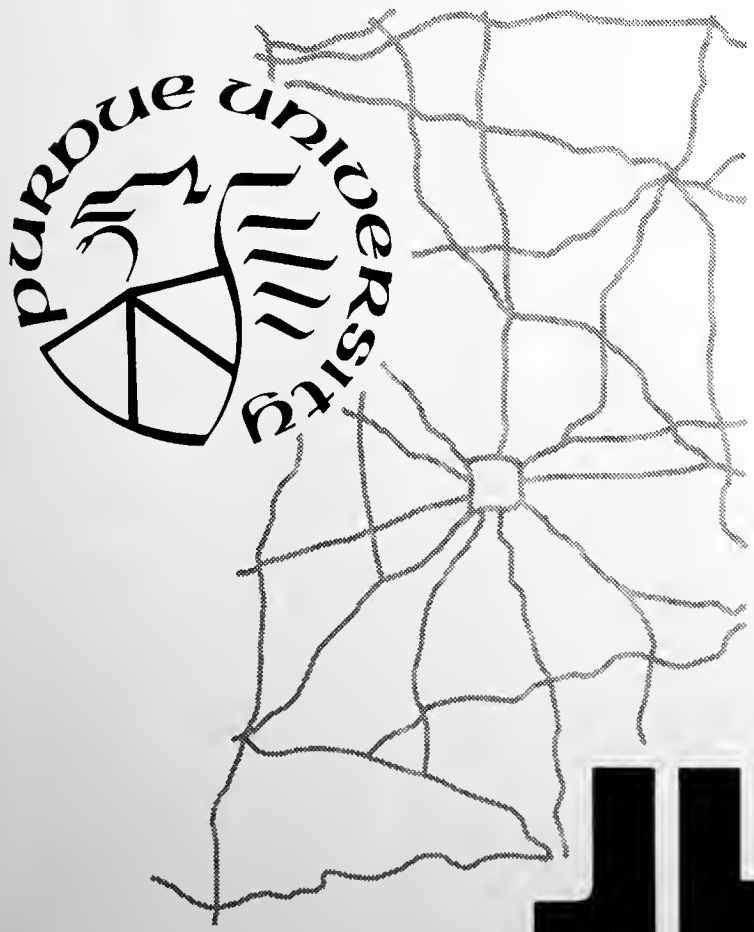
YOUNG DRIVERS' SEVERE AUTOMOBILE ACCIDENTS

SEPTEMBER 1971 – NUMBER 19



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PURDUE UNIVERSITY AND

INDIANA STATE HIGHWAY COMMISSION

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Progress Report

YOUNG DRIVERS' SEVERE AUTOMOBILE ACCIDENTS

TO: J. F. McLaughlin, Director
Joint Highway Research Project

September 28, 1971

Project: C-36-59K

FROM: H. L. Michael, Associate Director
Joint Highway Research Project

File: 8-5-11

The attached Progress Report titled "Young Drivers' Severe Automobile Accidents" has resulted from the research efforts of the past year on the approved research project "Driver Education and Traffic Accidents". The authors are Professor William Asher, Department of Education and Psychology, and Michelle Shapiro, Graduate Research Assistant. Professor Asher is directing the study.

The report presents characteristics of accidents and the young drivers involved in severe automobile accidents on Indiana highways in 1968 and discusses the relationship of the significant characteristics with an improved driver training program.

The report is presented in partial fulfillment of the objectives of this research.

Respectfully submitted,

Harold L. Michael

Harold L. Michael
Associate Director

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Progress Report

YOUNG DRIVERS' SEVERE AUTOMOBILE ACCIDENTS

by

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Joint Highway Research Project

Project: C-36-59K

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Conducted By

Joint Highway Research Project
Engineering Experiment Station
Purdue University

In Cooperation With

Indiana State Highway Commission

Purdue University
Lafayette, Indiana
September 28, 1971

ABSTRACT

Young Drivers' Severe Automobile Accidents

William Asher and Michelle Shapiro

The purpose of this research was to determine critical incidents of accidents in which a driver was aged 16 to 21, and a fatality or very serious injury occurred.

Driver training has been shown to be ineffective in reducing accidents in this age group of particularly hazardous drivers. Data about this age group's severest accidents, in terms of personal injury and deaths (not property damage), were collected to be used as a guide for a curriculum in driver education, the principal objective of which would be to reduce traffic accidents.

The Indiana State Police 1968 accident records were used. It was found that 4185 drivers aged 16-21 were involved in these serious accidents in Indiana during that year. Seventy-eight percent of these drivers were males, and twenty percent had been drinking. Females were drivers in only twenty-two percent of these accidents. Their speeds at the time of the accident were lower than the male drivers, less than 40 mph. as compared to over 40 mph. Only six percent of the female drivers had been drinking.

Twenty-one percent of these drivers had accidents on Saturday. Sunday accounted for an additional seventeen percent, and Friday accounted for another sixteen percent of these accidents. August, a good weather month, was the worst month.

Most driving after drinking occurred between midnight and 6:00 a.m. when 40% of these drivers had been drinking. Male drivers outnumbered female drivers eight to one during this time period.

The three major causes of accidents for this age group, as indicated by the records, were: (1) car left the roadway; (2) car collided with a fixed object; and (3) one car entered from an angle at an intersection.

Most drivers (sixty-four percent) were going straight ahead, were going too fast on a straight, level, blacktop, dry road, on a highway or in a residential area. The driver had no physical defects and he was a resident of the county in which the accident occurred.

Implications for changes in driver education curriculum were drawn. First, the predominance of males strongly suggests much more intensive work must be done with high school boys than with girls. The need for special care during driving, especially late at night, or avoiding driving during these periods, should be emphasized. Next, the extreme danger of drinking and driving, especially for males, must be reiterated. Finally, there is the seeming enigma of a major portion of these severe accidents being the result of the car leaving the road or colliding with a fixed object. This, combined with the conditions of two-thirds of the accidents occurring while the car was going straight ahead, on a straight, level, blacktop, dry road, strongly suggests major driver errors, probably alcohol or emotionally related; not perceptual-motor.

YOUNG DRIVERS' SEVERE AUTOMOBILE ACCIDENTS

William Asher & Michelle Shapiro

Purdue University

Traffic accidents are the leading cause of death for persons aged 15-24, equaling all other causes combined (National Safety Council, 1968). Further, Hart (1968) suggests that drivers in the late teens and the first half of the twenties have one-third of all accidents, although this group of drivers constitutes only 21% of all drivers.

What factors are associated with this preponderance of accidents for this age group? Improved engineering design of roads has greatly reduced environmental hazards relating to accidents. The 1966 Arthur D. Little report found that "in the absence of a very striking defect or failure in the roadway, the vehicle, or the driver's own medical condition, the cause of an accident is almost invariably assigned to one or another of a variety of driver errors. Thus, driver error is typically stated to be responsible for from 80% to 90% of all accidents" (p.37). Furthermore, Professor J. Stannard Baker of the Traffic Institute at Northwestern University stated that "it was impossible to identify the share of accidents that are directly attributable to mechanical defects but that he believed it to be probably under 5% of all accidents, and perhaps as little as 2% of all accidents" (A. D. Little report, 1966, p. 280).

Drivers in accidents were found by Conger (1959), in comparison to nonaccident drivers, to show a tendency (1) to have less capacity for managing or controlling hostilities; (2) to be either excessively self-centered or excessively socioentric (an "over-awareness of, interest in, and respect for the rights and feelings of others"); (3) to be excessively preoccupied with fantasy satisfactions or extremely "stimulus-bound"; (4) to be more fearful of loss of love and support; and (5) to be generally less able to tolerate

tension without discharging it immediately. In addition, the accident subjects tended to be categorized more frequently as consistently or occasionally belligerent or covertly hostile, and less frequently as only appropriately assertive, or unassertive. Shaw (1965), in a later study carried out in South Africa, confirmed Conger's general findings.

Rommel (1959) made a study of high school students in Pennsylvania. On the basis of a Driver Attitude Inventory and a test of emotional and personal adjustment, he concluded that youthful drivers having accidents tended to score high, and those free of accidents tended to score low, with regard to several attitudes: 1) an attitude to driving as an activity which relieves psychic tension; 2) an attitude toward driving as a form of behavior by which youthfulness may be compensated for and the role of an adult may be assumed; 3) an attitude toward driving which does not consider speed as an element of danger, or, if it is considered dangerous, an attitude manifesting desire for danger; 4) an attitude toward driving which places greater emphasis on the power of a vehicle than on its type or utility. On the personality tests he found that accident incurring youths showed more disregard of social mores, and more defiance of authority. Beamish & Malfetti (1962) used subjects which consisted of two groups of 16-19 year old male adolescents; 84 young male violators who had been referred to a juvenile court for two or more traffic violations, and a control group of 186 non-violators matched with respect to age, education, miles driven annually, and principal use made of the car. They found that the violator groups had certain common psychological characteristics: they do not give proper thought to the implications of their behavior for themselves and others; they tend to be in disagreement or conflict with others and perceive themselves as held down and imposed upon;

they are rebellious and selfish; and their hypersensitiveness, lack of self-confidence and feelings of personal unworthiness may lead them to over-compensate with erratic and ill-considered action resulting in traffic violators.

Asher & Dodson (1969) found that the students who are likely to have more accidents are those who stay up late on weekends, who have great interest in cars, who have high access to cars, and more importantly, who are not well acclimated in school, who turn in sloppy assignments and who are inattentive in class. Asher & Dodson (1970) found that of young people who had completed the TALENT questionnaire (425,000 U.S. high school students in 1960) and who were found to have died in an automobile accident in Indiana between May, 1960, and October, 1969, the fatality groups had less education and had more trouble reading, were less mature, learned to drive younger, had more access to cars, and may have taken driver training more. Their parents were of lower socio-economic status, had homes of less value, had less income and had less education than parents of the nonfatalities. Carlson & Klein (1970) found that for young people, traffic offenses correlate strongly with non-traffic offenses, and they suggest that the two types of offenses are not casually related but stem from an upbringing that stresses deviant rather than normative values. Waller & Goo (1969) found that the average speed at the time of collision was 36 m.p.h. for drivers under 30, 23 m.p.h. for those aged 30-59, and 18 m.p.h. for those aged 60 and older.

Thus, official reports and other data indicate that young drivers have a larger proportion of crashes suggesting reckless behavior. However, more detailed work, such as a job analysis, needs to be done in this area, concentrating on driver behavior which precipitates accidents in which there is

a serious injury or a death.

Problem

This study will attempt to discover what driving behaviors performed by young people aged 16-21 in Indiana contribute to accidents, and what the circumstances of their severe accidents are, in order to develop accident prevention curricula for young drivers.

Method

The subjects were 4185 drivers, age 16-21 inclusive, who were involved in a 1968 Indiana traffic accident in which there was a death and/or a serious injury, e.g. visible signs of injury, a bleeding wound, distorted limbs or had to be carried away. These 1968 traffic accident reports were obtained from the official records of the Indiana State Police. Cross tabulations were made using major variables as sex, day of the week, time of day (divided into four periods), month, character of location, type of accident, direction analysis, contributing circumstances, and driver's actions.

The records for these younger drivers were separated from a total of 50,188 reports, covering 19,501 accidents in which a person was injured or killed. One card existed for each driver and/or car involved in an accident, as well as one card for every person injured or killed. Also, overall frequency counts were made for almost all of these variables.

Results

Males composed 78% of these drivers with females comprising the remaining 22%. Males had most accidents on Saturdays from noon to 3:59 a.m. and from 7:00 to 7:59 a.m., while driving 30-49 m.p.h. August was their most frequent accident month. Twenty percent of the males had been drinking. On the other hand, the young women generally had accidents on Friday or Saturday,

from 3:00 p.m. to midnight and from 7:00 - 8:59 a.m., when going less than 10 m.p.h. or from 20 to 39 m.p.h. October was the month in which they had the most numerous accidents. Only 6% of these females had been drinking.

The day on which most accidents occurred was Saturday, when 21% of this group of drivers had accidents. On Saturdays, male drivers outnumbered female drivers two to one. Twenty-six percent of these Saturday drivers had been drinking. On Sunday, 17% of the drivers had accidents. Here male drivers outnumbered female drivers six to one and 22% of these drivers had been drinking. Finally, 16% of these drivers had accidents on Friday. However, there were only 3.5 male drivers for every female driver, and only 14% of these drivers had been drinking.

Most accidents occurred from noon to 11:59 p.m. From 6:00 p.m. - 11:59 p.m. 33% of these drivers had accidents, generally on Friday or Saturday. Males outnumbered females four to one, and 17% of this group had been drinking. From noon - 5:59 p.m. 28% of these drivers had accidents, usually on Friday, Saturday or Sunday. However, only 6% had been drinking, and males outnumbered females three to one.

Most drivers who had been drinking seemed to have accidents from midnight to 5:59 a.m., when 21% of all these young drivers had accidents. Forty percent of this group of drivers had been drinking. Male drivers outnumbered female drivers in this group eight to one.

Four major kinds of accidents accounted for 70% of these young people's accidents. First, 28% of these drivers ran off the road. This kind of accident was most frequent on Saturday and Sunday. Male drivers outnumbered female drivers five to one, and 28% of these drivers had been drinking. Second, 16% of the accidents occurred when the car collided with a fixed object. (No other

car was involved). Third, another 16% of the drivers had an accident at an intersection. Finally, 10% of these accidents occurred when the vehicles were approaching one another.

Most drivers (64%) were going straight when the accident occurred. The other four major types of driver's actions immediately before the accidents were: 1) passing, which accounted for 9% of these drivers; 2) turning, which 7% of the drivers were doing; and 3) skidding, which accounted for 14% of the drivers (about half before braking and half after braking). Finally, the major circumstance contributing to or which was the cause of the accident, as indicated by the investigating officers, was going too fast for conditions, which 22% of these drivers were doing. Thus, speeding evidently caused many drivers to collide with a fixed object or leave the road.

Eleven percent of these drivers had an accident in which one car was parked and one car was stopping in traffic. Ten percent of these drivers were "apparently asleep", and 14% had been drinking. Drinking was indicated as a major contributing circumstance for 7% of these drivers. Again, males were over-represented in this group of drivers seven to one.

The last two types of circumstances leading to an accident were driving left of center (not passing), 7% of the drivers, and failing to yield, 6% of the drivers. This last is the one circumstance when males and females were equally represented. Thus, young women should be taught to be especially alert at all intersections. This is evidently where they have their greatest problem with severe accidents.

Summary and Discussion

Drivers aged 16-21 involved in an accident where a serious injury or a death occurred, were usually going straight, on a straight, level, blacktop, dry road which had a clearly marked center line, in clear weather, with no

visual obscurements of the driver, in the open country or in a residential area. The accidents occurred typically on weekends, late at night or in the early morning, and in a car with no mechanical defects. The majority of accidents were of one type: the car ran off the road. The next three most common types of young people's severe accidents occurred when a car collided with a fixed object; a car ran into another car at an intersection; and when a car ran into another car coming from the other direction.

Males were greatly overrepresented for these accidents in this age group. Overall there were approximately three male drivers for each female driver. The drivers generally had no physical defects and were residents of the same county in which the accident occurred. Approximately 25% of these drivers had been drinking, which indicates that alcohol is a major contributor to severe accidents with this age group. This concern with alcohol can be seen particularly in the 28% of accidents in which the car ran off the road. Twenty-eight percent of these drivers had been drinking. Thus, it would appear that the non-drinking while driving campaigns are not reaching an important audience, and driver education courses should focus particularly on this aspect of driving.

Not only were male drivers overrepresented generally, but male drivers had most accidents from noon to 3:59 a.m. and from 7:00 - 7:59 a.m., whereas girls had most accidents from 3:00 p.m. - midnight and from 7:00 - 8:59 a.m. Males were generally going faster (30-49 m.p.h.) than females (less than 10 m.p.h. or from 20-39 m.p.h.). Finally, 20% of these male drivers but only 6% of these female drivers had been drinking. Thus, it is clear that attention should be focused on the male driver in this age group, and they should be made more aware of the effects of alcohol on their driving. Since most of these accidents occurred late at night or in the early morning, during

vacation periods or breaks from school (weekends), it might be wise to suggest methods other than using the car as a means of releasing pent up energies.

Speculation can be made about several methods which could be used in driver education courses to attempt to reach these drivers. Modified sensitivity groups could be organized in which these young drivers would have an opportunity to release some pent up emotions related to driving. Role playing involving emotional topics could also be used. Young drivers could act out their feelings regarding a severe accident. Perhaps with methods such as these they would inculcate emotionally the consequences of an accident and would not let irrational, emotionally pressured behavior dominate them while driving. Another procedure could be to have boys who had been in trouble with the police for bad driving and/or are hot rodders, help teach others to drive safely. By doing this they will be actively teaching and illustrating safe ways to drive. If they practice enough, they may drive better themselves. Finally, proper behavior can be modeled by peer or adult models. Then the students could practice the behavior in a simulator, later practice it in a car, and be rewarded for it. Thus good driving behavior will be acquired and made a habit.

Additionally, to help develop a better curriculum for driver education courses it would be helpful to modify accident report forms: to reduce "other" or "not stated" categories. Also, it would be advantageous to further train state police in accident investigation. Thus, accident records could be more valuable for scientific analysis and for developing preventive measures.

REFERENCES

Asher, W., & Dodson, B. Automobile accidents in the year following high school: The predictive value of 377 unobtrusive variables. Joint Highway Research Project, No. 33, Purdue University, 1969.

Asher, W., & Dodson, B. Social, psychological and educational characteristics of adolescents and young adults killed in Indiana automobile accidents. Progress Report, Joint Highway Research Project, October, 1970.

Beamish, J.J., & Malfetti, J.L. A psychological comparison of violator and non-violator automobile drivers in the 16 to 19 year age group. Traffic Safety Research Review, 1962, 6 (1), 12-15.

Carlson, W.L., & Klein, D. Familiar vs. institutional socialization of the young traffic offender. Journal of Safety Research, March, 1970, 13-25.

Conger, J.J., Gaskill, H.S., Glad, D.D., Hassell, Linda, Rainey, R.V., & Sawrey, W.L. Psychological and psychophysical factors in motor vehicle accidents. Journal of American Medical Association, 1959, 169 (14), 1581-1587.

Hart, Senator Phillip. Let's reward good drivers. True, July, 1969, 50 (386), 16.

Little, Inc. Arthur D. The state of the art of traffic safety. Cambridge, Mass.: Arthur D. Little, Inc., 1966.

National Safety Council, Accident facts. 1968 edition.

Rommel, R. C. S. Personality characteristics and attitudes of youthful accident repeating drivers. Traffic Safety Research Review, 1959, 3 (1), 13-14.

Shaw, L. The practical use of projective personality tests as accident predictors. Traffic Safety Research Review, 9 (2), 34-72.

Waller, J.A., & Goo, J.T. Highway crash and citation patterns and chronic medical conditions. Journal of Safety Research, March, 1969, 1, 13-27.